نام و نام خانوادگی ...محمدحسین خوش‌بندی... پاسخنامه تشریحی تکلیف شماره ...۱۶... کلاس ...دهم تجربی ۱۹...

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الف) $27^\circ = (x)\,rad \longrightarrow \frac{27}{180} = \frac{x}{\pi} \Rightarrow \frac{3}{20} = \frac{x}{\pi} \Rightarrow 3\pi = 20x \Rightarrow x = \frac{3\pi}{20} = \boxed{0/15\pi}$

ب) $125^\circ = (x)\,rad \longrightarrow \frac{125}{180} = \frac{x}{\pi} \Rightarrow \frac{25}{36} = \frac{x}{\pi} \Rightarrow x = \boxed{\frac{25\pi}{36}}$

ج) $\frac{5\pi}{12}\,rad = (x)^\circ \longrightarrow \frac{\frac{5\pi}{12}}{\frac{\pi}{1}} = \frac{x}{180} \Rightarrow \frac{5}{12} = \frac{x}{180} \Rightarrow 12x = 180 \times 5 \Rightarrow x = \frac{180 \times 5}{12} = \boxed{75^\circ}$

د) $\frac{4\pi}{9}\,rad = (x)^\circ \longrightarrow \frac{\frac{4\pi}{9}}{\frac{\pi}{1}} = \frac{x}{180} \Rightarrow \frac{4}{9} = \frac{x}{180} \Rightarrow x = \boxed{80^\circ}$

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$10a + \frac{\frac{135a}{9}}{8\,40} + \frac{\frac{a\pi}{8}}{\frac{\pi}{1}} = \frac{5a}{72} + \frac{a}{8} + 10a = \frac{5a+9a}{72} + 10a = \frac{14a}{72} + 10a = \frac{7a}{36} + 10a$

$= \frac{367a}{36} \to \frac{367a}{36} = 180 \Rightarrow 367a = 180 \times 36 \Rightarrow a = \frac{180 \times 36}{367} \Rightarrow \boxed{a = 17/65}$

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الف) $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan 45^\circ + 2\cot 45^\circ \xRightarrow{(1),(2)} 0 + \tan 45^\circ = \boxed{1}$

$\left.\begin{matrix}\cos 60^\circ = \sin 30^\circ \\ \cos 30^\circ = \sin 60^\circ\end{matrix}\right\} \Rightarrow \cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ = \sin 30^\circ \sin 60^\circ - \sin 60^\circ \sin 30^\circ = 0 \quad (1)$

$\sin 45^\circ = \cos 45^\circ \Rightarrow (\sin 45^\circ)^2 = (\cos 45^\circ)^2 \Rightarrow \frac{\sin 45^\circ}{\cos 45^\circ} = \frac{\cos 45^\circ}{\sin 45^\circ} \Rightarrow \tan 45^\circ = \cot 45^\circ$

$\Rightarrow -\tan 45^\circ + 2\cot 45^\circ = -\tan 45^\circ + 2\tan 45^\circ = \tan 45 \quad (2)$

ب) $\frac{\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ}{\cot 30^\circ - \cot 60^\circ} = \frac{\frac{1}{3} + 3 + 1}{\frac{\sqrt{3}}{1} - \frac{1}{\sqrt{3}}} = \frac{\frac{13}{3}}{\frac{2}{\sqrt{3}}} = \boxed{\frac{13\sqrt{3}}{6}}$

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$-\sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ = \sin^2\theta \Rightarrow -\frac{1}{4} + \frac{3}{4} = \frac{1}{2} = \sin^2\theta \Rightarrow \sin\theta = \pm\frac{1}{4}$

چون حاده است $\Rightarrow \sin\theta = \frac{1}{4}$

$\sin 30^\circ = \cos 60^\circ = \frac{1}{2}$

$\cos 30^\circ = \sin 60^\circ = \frac{\sqrt{3}}{2}$

$\sin^2 + \cos^2 = 1 \Rightarrow \frac{1}{2} + \cos^2 = 1 \Rightarrow \cos^2 = \frac{1}{2} \Rightarrow \cos\theta = \pm\frac{1}{4}$ → چون حاده است $\Rightarrow \cos\theta = \frac{1}{4}$

$\Rightarrow \tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{\frac{1}{4}}{\frac{1}{4}} = \boxed{1}$

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$\tan 30^\circ = \cot 60^\circ \Rightarrow \tan^2 30^\circ = \cot^2 60^\circ$

$\Rightarrow \frac{2\tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 60^\circ)^2} = \frac{2\tan 30^\circ (1 - \cot^2 60^\circ)}{(1 - \cot^2 60^\circ)^2} = \frac{2\tan 30^\circ}{1 - \cot^2 60^\circ} = \frac{2 \times \frac{1}{\sqrt{3}}}{1 - \frac{1}{3}} = \frac{\frac{2}{\sqrt{3}}}{\frac{2}{3}}$

$\tan 30^\circ = \frac{1}{\sqrt{3}}$

$\cot^2 60 = \frac{1}{3}$

$= \frac{3}{\sqrt{3}} = \sqrt{3} = \tan\theta$

$\Rightarrow \theta = 60^\circ, 240^\circ$ → چون حاده است $\Rightarrow \theta = 60^\circ$

$\frac{60^\circ}{180^\circ} = \frac{x}{\pi} \Rightarrow \frac{x}{\pi} = \frac{1}{3} \Rightarrow x = \boxed{\frac{\pi}{3}}$

(ادامه‌ی سوال ۳ قسمت «ب») $\tan 30^\circ = \frac{1}{\sqrt{3}} \Rightarrow \tan^2 30^\circ = $ [illegible] $\quad \cot 30^\circ = \frac{1}{\tan 30^\circ} = \frac{1}{\frac{1}{\sqrt{3}}} = \sqrt{3}$

$\tan 60^\circ = \sqrt{3} \Rightarrow \tan^2 60^\circ = 3 \quad \cot 60^\circ = \frac{1}{\tan 60^\circ} = \frac{1}{\sqrt{3}}$

$\tan 45^\circ = 1 \Rightarrow \tan^2 45^\circ = 1$

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$$\tan\theta=5 \Rightarrow \frac{\sin\theta}{\cos\theta}=5 \Rightarrow \sin\theta=5\cos\theta$$

$$\Rightarrow \frac{3\sin\theta-\cos\theta}{\sin\theta-4\cos\theta}=\frac{15\cos\theta-\cos\theta}{5\cos\theta-4\cos\theta}=\frac{14\cos\theta}{\cos\theta}=\boxed{14}$$

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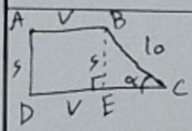
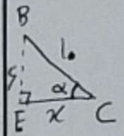


$$\left.\begin{aligned}\sin\alpha=\frac{\overline{BE}}{\overline{BC}}=\frac{6}{10}\\ \overline{BE}=6\end{aligned}\right\}\Rightarrow \overline{BC}=10$$



$6^2+x^2=10^2 \Rightarrow 36+x^2=100 \Rightarrow x^2=64 \Rightarrow x=\pm 8 \rightarrow$ چون طول است $\Rightarrow x=8$

محیط ذوزنقه $=6+7+10+8+7=\boxed{38}$

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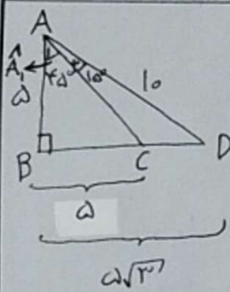

$$\hat{A}=60^\circ \Rightarrow \begin{cases}\sin\hat{A}=\frac{\sqrt{3}}{2}=\frac{\overline{BD}}{10} \Rightarrow \overline{BD}=5\sqrt{3}\\ \cos\hat{A}=\frac{1}{2}=\frac{\overline{AB}}{10} \Rightarrow \overline{AB}=5\end{cases}$$

$$\hat{A}_1=45^\circ \Rightarrow \tan\hat{A}_1=1=\frac{\overline{BC}}{5} \Rightarrow \overline{BC}=5$$

$$\Rightarrow \overline{CD}=\overline{BD}-\overline{BC}=\boxed{5\sqrt{3}-5=5(\sqrt{3}-1)}$$

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الف)  → در ناحیه چهارم

ب)  → در ناحیه دوم

۱۰

$$\tan x=\frac{1}{3} \Rightarrow \frac{\sin x}{\cos x}=\frac{1}{3} \Rightarrow 3\sin x=\cos x$$

$x \rightarrow$ در ناحیه سوم $\Rightarrow \begin{cases}\sin<0\\ \cos<0\end{cases}$

$$\sin^2 x+\cos^2 x=1 \Rightarrow \sin^2 x+(3\sin x)^2=1 \Rightarrow \sin^2 x+9\sin^2 x=1 \Rightarrow 10\sin^2 x=1 \Rightarrow \sin^2 x=\frac{1}{10}$$

$\Rightarrow \sin x=\pm\frac{\sqrt{10}}{10}=\frac{\pm 1}{\sqrt{10}}$ —(چون در ناحیه سوم است)→ $\boxed{\sin x=-\frac{\sqrt{10}}{10}=\frac{-1}{\sqrt{10}}}$